Prediction of Future Development of the World Economy under Conditions of Negative Interest Rates

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Abstract: *The paper deals with the problems of contemporary way of using interest rates within the framework of monetary regulation, with special focus on cases when extremely low, or even negative rates are applied. The first part is focused on theoretic definition of the meaning and function of interest rates in financial and economic system in the sense of „standard" economic theory, or in accordance with individual economic approaches. Subsequently, the influence of contemporary extremely low or even negative interest rates of central banks are analyzed, as well as their influence on the activities of economic subjects, with special attention to individual sorts of financial institutions, namely its influences on their economic results and on fulfilment of their mission. And, subsequently, it defines and characterizes the impacts of contemporary monetary policy of the world most important central banks on functioning of economy of individual the most important states or multinational economic units, as well as world global economy. Based on achieved results, future development is predicted, both from the point of view of economic development and from the standpoint of future impacts on contemporary human society.*

Keywords: economy, financial system, interest rates, monetary policy, household wealth

JEL codes: E43, E44, E47, G01, G17

1 Introduction Recently, non standard ways of management of individual countries' economies can be observed worldwide. It is a result of the fact that financial crisis, which started in the year 2008, has not been satisfactorily solved; it has not only been overcame, it has been gradually deepening; at present, it endangers both financial systems of the most important countries of the world and the whole global economy.

Monetary policy plays a significant role in contemporary management of national or supranational economies, respectively. It is because contemporary crisis factors are not of the same type as those that emerged in the past, within "traditional" depressions that appeared within economic cycle. At the moment, we speak about financial crisis; it exists despite of the fact that economies of most states have been slowly growing. It is a result of the fact that crisis phenomena are under process in financial systems of individual states (in case of the Eurozone within the whole supranational community), as well as in world financial system. Since the financial system is an integral part of related economic system, it is obvious that its potential collapse must inevitably affect real economy. It means, in other words, that unless we manage to solve contemporary financial crisis, collapse of real economy on all levels can be reckoned.

2 Methodologies and Date

Contemporary problems of world economy did not originate all by itself; it is a result of a number of reasons that arose from erroneous, or possibly intentional destructive operation of people. It is obvious that in order to get a chance to solve it, it is necessary to analyze current situation both in financial systems and economies of individual countries, as well as in global world financial system and global economy. Nevertheless, it is necessary not only to deal with economy, including finances, but with a number of related factors.

Used methodology represents a combination of qualitative and quantitative analysis. Qualitative component of performed research is represented by findings of economic theory that are subsequently compared with contemporary way of management of the most important world economies. As for economy, following theoretical approaches are applied: *„Classical theory of interest rates", "Liquidity preference theory of interest rates", "The loanable funds theory",* and *"The rational expectations theory of interest rates"*, where monetary economy is represented, namely *"Fischer´s quantity theory of money".* With regard to quantitative constituent, it is based on economic data which have been taken from Eurostat database, US Department of the Treasury and Trading economics.

3 Results and Discussion

3.1 Theoretically–economic conception of the importance of interest rates

Interest rates can be considered to be one of the most significant factors of market operations of financial markets. Classical economists allege that: "the level of interest rates, or mere expectation of their changes, significantly determine behaviours of all subjects that make business at financial markets. With regard to the fact that both borrowers and investors can pass between its individual segments, interest rates are factors that mutually interconnect the whole financial market and help keep it balanced". As financial market can be perceived as an inseparable part of related financial system, which is an inseparable part of related economy, its exceptional importance both in national economies and global world economy is obvious.

Following most important functions are guaranteed by interest rates in financial system and by means of it in economy (Giddy, 1994; Rose, Marquis, 2009):

- Regulate the flow of common savings into investments, which supports economic growth.
- Allocate distribution of disposable financial resources into the most profitable investments with the shortest period of return.
- Bring offer and demand of money into balance.
- Taking into account its influence on the amount of savings and investments, they represent exceptionally important regulation tool kept by the state.

Above mentioned facts show that interest rates are an extraordinarily important factor that influences the operations of economy and keep it balanced, which means effectively functioning condition. It means that their correct height and high flexibility are inevitable for the economy to be able to perform its unique function, which means satisfying (gradually growing) final consumption of the population and increasing general welfare and quality of human life.

How do individual economic attitudes (theories) face economic importance of interest rates? *"Classical theory of interest rates"* considers interest rate to be a bonus, paid to creditors for "sacrifice" their current consumption for a promise of higher consumption in the future. Or, by other words, for providing their disposable monetary funds to realize investments that should increase abilities of the economy to produce, and subsequently, it should meet the needs of their citizens. To the contrary, *"Liquidity preference theory of interest rates"* considers interest rate to be a reward for providing liquidity, which the owner of the money gave up and received less liquid securities (or in given case bonds), where the interest rate depends on the length of this period. *"The loanable funds theory"* considers interest rate to be the main factor, influencing exchange rates in following way – the higher the interest rates in one state, compared with foreign countries, the higher demand for its bonds; this results in growth of local currency. As far as the theory *"The rational expectations theory of interest rates",* is concerned, it delineates the importance of information regarding future development of interest rates (in the same way as in case of inflation). Broadly speaking, the principle of "inertial inflation" is transferred into the principle of "inertial development of interest rates", which means that if public opinion on future development of interest rates is created, it will subsequently influence future development of nominal interest rates.

All four mentioned interest rate theories show that the importance of interest rates in the economy is undisputable. Nevertheless, it is undisputable that all of them "work" solely with positive interest rates; it follows that negative interest rates are, from the point of view of theory of economy, unimaginable.

Currency regulation has, apart from absolute value of exchange rate, another related tool, which is goal-directed influencing of amount of money in money circulation. In this area, too, there is a number of economic attitudes that use different ways to work with so called quantitative theory of money, which is based on statement that the offer of money (monetary supply) directly influences price level. There is a number of individual theoretical attitudes, before all Fisher transaction equation; it is based on David Ricardo's opinion that: "the value of money changes in inverse proportion to its amount in circulation". Irving Fisher introduced his commonly known "Equation of Exchange" in his book "The Purchasing Power of Money" (Fisher 1922):

$$M \cdot V = P \cdot T \qquad (1)$$

Where: M – money supply, V – velocity of circulation, P – average price level, T – volume of physical transactions of goods and services.

The left side of the equation expresses cash flow within certain period of time, the right side expresses monetary value of transactions, realized within this time period. In other words, this is "macroeconomic condition of balance"; unless it is met, mechanisms are activated that establish equilibrium by means of price-level change.

3.2 Analysis of economic impacts, incurred as a result of extremely low, or even negative interest rates

Extremely low interest rates signalize serious macroeconomic problems, where negative interest rates evidence extreme problems. It implies that purpose-built use of negative interest rates mean non-standard (and insufficiently verified) non-conventional ways of monetary regulation that might, beside usually only partial immediate remedy, significantly and on long-term basis breach operation of economics in the future. There is even a threat of significant and irremovable negative impacts.

At present, more and more central banks worldwide are announcing negative interest rates. European Central Bank, Bank of Japan and Swiss National Bank belong to the most important ones, but Central Bank of Denmark and Central Bank of Sweden joined the trend.

At the moment, only deposit rates are concerned, which are short-term interest rates applied by central banks to commercial banks deposits. The purpose is to make commercial banks to activate lending of non-banking economic entities and support economic growth. On the other hand, there is a question, what would happen if negative interest rates affected non-financial economic entities, too, or what are the dark sides of using negative interest rates and what sort of risks they bring into financial system and into economy?

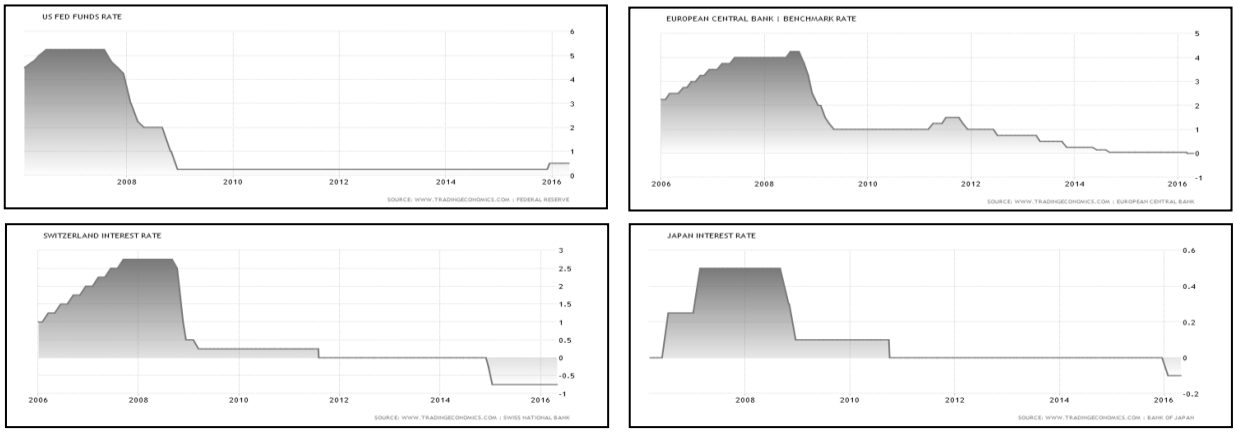
This topic has been discussed on professional level for a number of years; it is obvious that contemporary policy of extremely low interest rates of central banks cannot be analysed separately, but as an inseparable part of expansive monetary policy. This is being applied by central banks of overwhelming majority of countries, attempting to boost economy. Nevertheless, with regard to extreme indebtedness of households, companies and states, implementation of classical tools is less and less effective, which leads to searching for non-standard tools and their implementation. Extremely low or even negative interest rates, often and intensively used, together with "printing money" is partly a result of central banks policies to depreciate domestic currencies to support export, domestic consumption and investment, but, at the same time, it is an attempt to decrease the impacts of extremely high indebtedness of states, corporations and growing number of households.

This form of monetary policy is far from being only positive; it can cause a number of both unpredictable and predictable consequences. For example analytics of American

Goldman Sachs warned central banks that: "non-conventional stimulation measures have their limits and in the end, they can harm economies as well as help them" (Urbánek 2015). They gave the opinion that: "excessive and non-conventional activity of central banks can result in consequences that governments and companies "become lazy"; they should, before all, struggle to boost economic growth. In this respect, it can even bring inverse effect and it might be extremely hard to cancel these stimulation measures." Opinions of other economists are very similar. For example, the governor of the Czech National Bank Singer (2006) mentioned, when he came back from the meeting of the International Monetary Fund that "negative interest rates do not bring, from the point of view of demand support, any relief for central banks. At the same time, he presented an opinion that "monetary policy itself can hardly return world economies to long-term path of growth", which is in agreement with economic theory that "the role of monetary policy is not to influence long-term economic trends, but to absorb oscillation of economic cycle" (Mishkin 2016).

Figure 1 shows that contemporary interest rates of central banks are extremely low on a long-term basis and they have been still dropping; ten-year development of main interest rates FEDu, ECB, and central banks of Switzerland and Japan (four so called "majors").

Figure 1 The development of main interest rates of central banks for four main world currencies



Source: Trading Economics

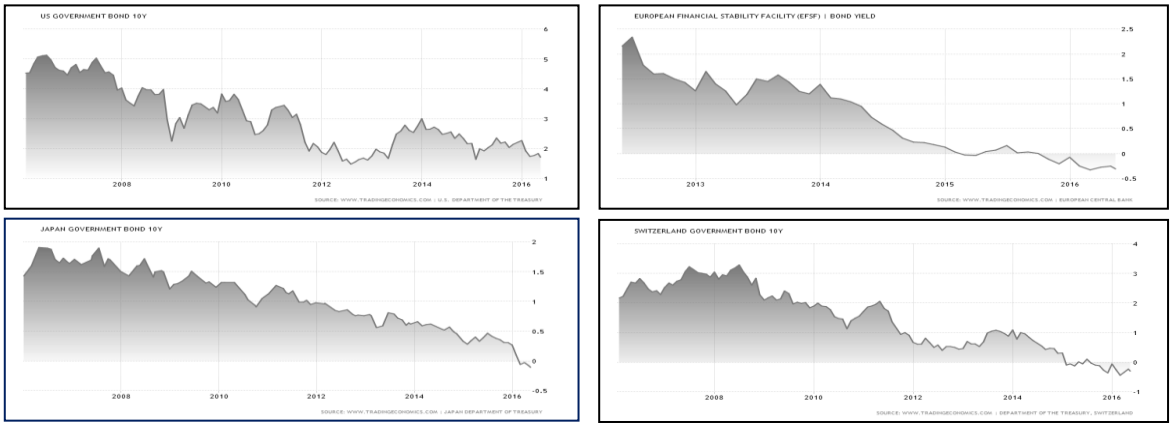
What are (or will be) the most important impacts of negative interest rates as a tool of monetary policy of central banks? Following areas of problems have been discussed the most often:

- **Suppression of the function of market allocation mechanism of monetary funds into the most effective investment projects:** This means denial of the importance of interest rates in the sense of *"Classical theory of interest rates"* in the sense that unless there is interest, paid by debtors for borrowing money, efficacy of their investing cannot exist, either. These days, the validity of this theory can be proved for example by current bankruptcies of oil companies and shale gas companies that would never had been opened if "normal" interest costs would have been applied.
- **Suppressing of interest to invest into debt instruments:** When the interest rates are low, the interest to save or invest into debt instruments decreases; in case of negative interest rates, it is nonsense to save money in banks, or to change them for any classical debt investment tools.

  Following Figure 2 shows ten years period of decrease of profitability of long-term (ten year) bonds of the US, Switzerland, Japan and Eurozone (EFSF bonds were used in this particular case). It proves the fact that the trend is on long-term basis in all mentioned cases; it started in 2008 as a result of financial crisis development.

Furthermore, profitability of long-term bonds starts getting negative in some countries and there are no signs of return to normal status.

Figure 2 Example of a decade of decrease of ten-year bonds issued by the US, Eurozone (EFSF bonds), Japan and Switzerland.



Source: Trading Economics

The following chart shows contemporary distortion of bond markets in a number of significant countries from the point of view of profitability of their long term bonds, depending on actual size of their public debt, related to gross domestic product.

Table 1 Indebtedness of selected states and profitability of their ten-year bonds

State	Debt to GDP [%] (December 2015)	Government bonds 10Y [% p.a.] (May 2016)
United States	104.2	1.71
China	43.9	2.90
Japan	229.2	- 0.11
Russia	17.9	8.79
United Kingdom	89.2	1.38
India	66.4	7.45
Brazil	66.2	12.25
Australia	33.9	2.25
Eurozone/*	**90.7**	***/EFSF - 0.31**
Germany	71.2	0.13
France	95.8	0.47
Italy	132.7	1.48
Spain	99.2	1.61
Portugal	129.0	3.18
Belgium	106.0	0.52
Greece	176.9	7.42

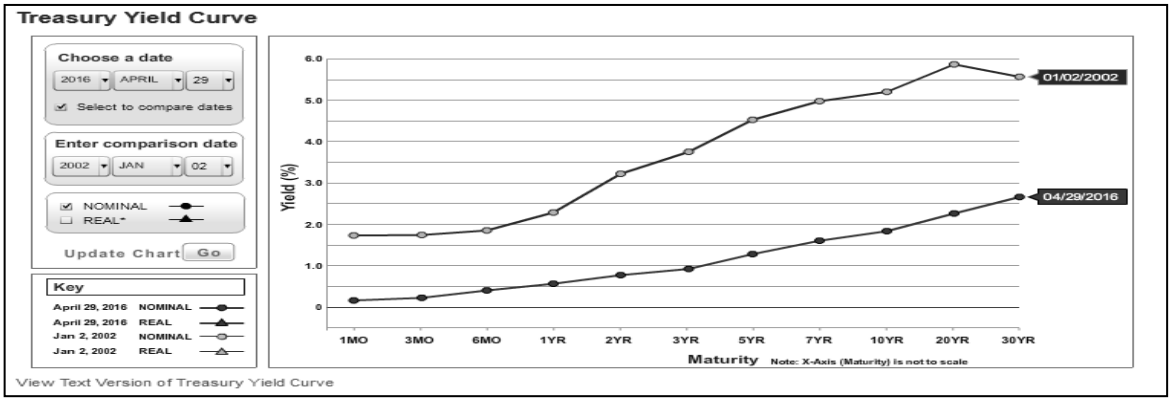
Source: Trading Economics */EFSF-The European Financial Stability Facility]

The chart shows that Eurozone countries and Japan are the most distorted; their central banks have been using the tool of negative interest rates.

- **Support of investments into shares:** Extremely low or even negative interest rates decrease revenues of debt tools, which results in demand for alternative investment instruments, before all shares. In connection with it, their rates are growing; in a number of countries, this led to formation of speculative share bubble (especially in case that commercial banks and central banks take part in the business).

- **Support of investments into real assets, especially into real estate:** Extremely low (or negative) interest rates result in inflation expectations, which means increased demand for active assets. In view of the fact that the interest rates are almost zero, demand for mortgage loans and subsequently for real estate has been growing; subsequently, prices of real estate are growing too, which leads to speculative bubble in the real estate market.
- **Negative impact on economic activities of commercial banks:** There is a rule that bank assets are usually on long-term basis, but they are financed by short-term liabilities. This shows that banks gain Net Interest Margin from the difference between short term and long term interest rates. In case of extremely low interest rates, the yield curve is malformed in a way that its standard, "roughly logarithmic" shape is "getting flattened", as we can see in figure 3.

  Figure 3 Comparison of historical yield curve of American government debentures, issued in January 2002 (after speculative bubble burst in 2001) and similar contemporary curve (after the first increase of interest rates by FED in December 2015).



Source: US Department of the treasury

The above mentioned figure shows that in the US, the differences in profitability of short-term and long-term assets are currently significantly lower than usually, compared with the year 2002; further decrease of interest rates would result in further reduction.

- **Negative impact on economic activities of pension companies or pension funds:** This is very important risk factor related to the fact that liabilities of the funds are calculated by the method of discounting of future liabilities. It is important to say that, as Ender says (2016), there are so called "*Defined contribution funds*" that pay the sum the person saved, increased by the sum of revaluation, but there are "*Defined benefit funds*" that made commitment to pay pre-agreed sums. These funds are deeply endangered by decreasing of interest rates; the lower the interest rates, the higher the liabilities and the more assets they need that would have to, in case of negative interest rates, exceed the nominal value of liabilities. This makes the owners of such funds enter risky business, and sometimes even to technical insolvency.
- **Change of standard properties of financial investment assets and liabilities:** Financial investment instruments represent property that bring revenue to its owners (or it is supposed to bring it in the future); on the contrary, (financial) liabilities can be, in this case, defined as obligations. But what will happen with investment assets and liabilities that are in balance sheets (balances) of financial institutions in case of negative interest rates? In such cases, it might result in turning their properties, which would mean assets would bring negative (nominal) revenue, while liabilities would bring positive (nominal) revenue. This would mean complete change of behaviours of business participants at financial markets with disastrous consequences. In such a case, bonds would be bought, due to negative revenues, solely by speculators for the purpose of short-term possession, moreover only in cases that even deeper decrease of interest rates was expected.

- **Unpredictable development in derivative markets:** It is estimated that the total value of derivative instruments, or futures, and structured products, amount to one quadrillion (one thousand trillion) US dollars (Snyder 2014) worldwide. Many of them are subject of interest, monetary or credit instruments that might show unexpected price development in case of change of valuation or change of interest, or (in case of credit derivatives) they might "activate". Such risks can be considered to be highly extreme.
- **Dependence of commercial banks and other financial institutions and potential investors on central banks:** Riskiness of this factor is based on the fact that central banks are more and more influential and they are more and more involved in economy management. It means that, although their representatives are not elected bodies, they more and more decide on economic courses of states. Currently, the situation is very serious; the principle that the development of market prices is decided by market outcomes of their issuers is not valid anymore; the rule "the worse the better" is slowly becoming valid. This is a consequence of expectations that every new problem will result in further easing of monetary policy.
- **Support of further indebtedness of all economic subjects:** extremely low or even negative interest rates result to further indebtedness of states, companies and households. As the statement "stimulation causes further stimulation" is considered to be proven, it is obvious that the longer the period of this monetary policy is, the more difficult it would be to change it. At present, we are worried, before all, that the extent of indebtedness exceeded "point of irreversibility" and the way back is impossible.
- **Creating conditions for future galloping inflation or hyperinflation, or alternatively monetary reforms:** These issues are theoretically dealt with by monetary economy. Despite the fact that there are several partly different theoretical attitudes, there is one thing they all have in common: they turn attention to the fact that in case central banks start "printing money" it would lead to inflation. In this case, Irving Fisher´s equation of exchange can be used; it suggests that under condition of contemporary "printing" money the circulation of money speeds up, it would result at least in galloping inflation; the later it happens, the higher the inflation will be in future.

3.4 Prediction of future economic development in case of long-term use of negative interest rates and "printing" money

When analyzing impacts of negative interest rates, the factor of time must be considered. In such a case factor of time means the period of time in which central banks would purposefully announce negative interest rates. The length of the period when they are used plays an important role as far as their impacts and consequences are concerned.

Short-term, or operative use of negative interest rates can be analyzed on national levels. It follows that central banks of individual countries (except for Eurozone countries) pursue monetary policy independently, or at their own discretion and in various periods. This is why these negative interest rates, usually not very drastic, are before all psychological.

In case that negative interest rates are used on long-term basis, moreover in cooperation with further printing money, following development can be predicted: in the beginning, the economy will be "pseudo-stabilized", but it will be redeemed by further indebting (which has been happening right now); one day, critical limit will be exceeded. Further expansion, including printing further money and further decreasing interest rates will be enforced (it means even more negative values). Commercial banks will not be able to bear it anymore and they will introduce negative interest rates of bank deposits; it will result in complete lack of interest in deposits and bonds, panic withdrawing money and unsatisfiable panic demand for liquidity. This will be followed by restricting and gradual cancellation of cash money and forced changeover to electronic money. It will cause the end of both economic and personal freedom and will result in mass riots and collapse of economic systems on all levels.

In case that the critical level of indebtedness is exceeded (the point of irreversibility, which cannot be exactly defined, but it is believed it has already been exceeded in a number of countries) and central banks tried to stop the process of further growth of indebtedness and increased interest rates, market interest rates would grow, too. It would cause bankruptcies of many economic entities, including a number of states, this would result in domino effect; bankruptcies would spread worldwide by means of banking and financial systems. There is a reason to assume that bankruptcies of states will start (due to common currency) in the most indebted countries of southern wing of Eurozone (Sulík 2012; Robejšek 2015; Rejnuš, 2015), followed by disintegration of the Eurozone and subsequently of the whole European Union (at the same time, there are other important states where bankruptcy is not excluded). This will cause serious disruption of the whole global economy and will cause the same catastrophic result as the previous case.

4 Conclusions

The analysis shows that negative (for now mostly deposit) interest rates of central banks can be currently considered to be a tool of psychology, to put pressure on commercial banks to be more willing to provide loans to non-financial subjects and to depreciation of domestic currencies within ongoing monetary wars. Nevertheless, in case they move into more negative values, and subsequently were transferred to clients of banks, they would become extremely dangerous for economy. The longer is this non-standard tool used, the more serious consequences would be brought; at the same time, it cannot be separated from other non-conventional tools of monetary regulation, especially from printing money.

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